

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in Convertible Furniture.

I, ALBERT DUCROT, of 5, Rue de Colannes du Trône, Paris, France, a French citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention has for object a convertible seat, which can be very easily transformed at will into an ordinary arm-chair, or into a large comfortable arm-chair constituting a kind of "semi-couch", the back of which lies further down and is higher so as to provide a comfortable support both for the back and for the head, without however increasing thereby the dimensions of the seat and back of an ordinary arm-chair.

In the arm-chair according to the invention, the seat and back are movable relatively to the framework; the seat can be moved forward or backward, and the back can be raised or lowered bodily behind the seat a determined amount, at the same time as its inclination varies.

These movements of the seat and back are made to depend on each other through a very simple linkwork, so arranged that when the piece of furniture forms an ordinary arm-chair and the seat is moved forwardly, the said linkwork lifts the back to a sufficient extent, so that the user may rest his head thereon and, at the same time, causes the said back to incline backwards, thus providing a more comfortable support for the user's back. The reverse transformation is effected by pushing the seat backwards or by lowering the back.

The various parts above mentioned are moreover so devised that the balance of the jointed system back, linkage and seat, is sufficiently approximate for rendering the manipulation very smooth as well in one direction as in the other; moreover, the person seated in the arm-chair can easily bring the latter in semi-couch position, without having to get up.

The accompanying drawing illustrates, by way of example only, in side elevation (the left-hand upright of the framework being broken away), four forms of carrying out the subject-matter of the

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invention.

Figs. 1, 2, relating to a first form of construction, respectively illustrate the piece of furniture in arm-chair position and in semi-couch position.

Figs. 3, 4 illustrate a second form of construction.

Figs. 5 and 6 are side elevations, with parts broken away, of a third form of construction, and respectively correspond to the position of an ordinary arm-chair and to the rocking-chair position.

Fig. 7 is a partial section made according to line A—A of fig. 5.

Fig. 8 is a diagrammatic side elevation of a fourth form of construction.

The arm-chair illustrated in figs. 1, 2, comprises a seat 1, which can move forwardly or backwardly relatively to the framework, by sliding on a cross member or on supports 2, arranged at the front of this framework.

On either side of this seat, at the rear, is mounted a pin 3 which slides in a slot 4 provided at the front end of a lever 5.

The lever 5, which is approximately horizontal when the piece of furniture is in arm-chair position, (fig. 1), is pivotally mounted on a fixed stud 6 carried by the framework, and pivoted, at its rear end 7, on the base of the back 8.

In the position illustrated in fig. 1, this back rests on the rear cross member 9 of the frame-work.

It is held in position, on the other hand, on either side, by a rod 10 pivoted on the same at 10a and on the framework at 11.

The lever 5 is thus supported at two points 6, 7, and the pin 3, which is located at the rear end of the slot 4, between these two points, rests on the lower edge of this slot and supports the seat 1 at the rear.

To cause the piece of furniture to assume the position shown in fig. 2, it suffices to pull the seat 1 forwardly in the direction of the arrow F_1 ; when the pin 3 has passed the stud 6, it bears on the front end of the lever 5, which it causes to pivot in the direction of the arrow F_2 .

Owing to this movement, the rear of

the seat 1 lowers, and the end 7 of the lever 5 lifts the back 8, by causing the lever 10 to pivot in the direction of the arrow F.

5 These movements are limited by a cross member 12 of the frame-work, on which cross member the rear of the seat 1 comes to rest (fig. 2).

10 In this position, the piece of furniture constitutes a semi-couch, the seat of which is inclined, and the back is higher and inclined backwards. It is to be noted that a person seated on the piece of furniture in arm-chair position, can effect the above operation and cause it to take the second position without having to get up; in fact, it suffices for this person to press upon the arm-rests 13 supported by the uprights of the framework, and to thrust the seat forwards without having to get up.

The combined action of this thrust and of the weight of the person causes all the movements indicated above.

25 To return to the arm-chair position, it suffices to push the seat backwards and, if need be, to exert a downward pressure on the top of the back.

30 If it is desired to give to the back an inclination variable at will, instead of the rods 10 simply pivoted on the framework and on the back, use can be made of rods having several holes or provided with a slot having rack teeth, or several holes can be formed in the framework for receiving the stud 10a, or any other suitable means can be employed for varying the distance between the studs 10a; 11, or the effective length of the rods 10.

40 The form of construction illustrated in figs. 3 and 4 differentiates from the preceding one in that the lever 5 is replaced by a bent lever 14 pivotally mounted, at its bend, on a fixed stud 6.

45 The studs 3 and 7 of the back and seat are respectively pivoted on both ends of this lever.

50 When the piece of furniture is in the arm-chair position and that the back rests on the rear cross member 9, the arm 6—3 of the lever 14 supporting the seat is slightly inclined backwards, so that the weight of the person seated holds the entire structure stationary.

55 The semi-couch position is obtained by moving the seat forward, this causing the lever 14 to pivot in the direction of the arrow F.

60 The movement is limited for instance by the fact that rods 15, pivoted, on the one hand, on the seat 1 and, on the other hand, on the fixed framework, abut against fixed supports 2.

65 It is to be noted that, as in the first form of construction, the operation can

be very easily effected by the person seated in the arm-chair, without this person having to get up; in fact, it suffices for the said person, by pressing upon the arm-rests 13, to push the seat forward, 70 by slightly rising from the arm-chair at the beginning of the movement for following the movement of the rear of the seat, which latter is also lifted until the arm 6—3 has passed through the vertical. 75

A thrust exerted on the seat from the front to the rear, or a downward thrust exerted on the back, suffices to return the piece of furniture to the arm-chair position; in fact, in this second form of construction, the movements of the back and seat are rendered entirely dependent on each other, owing to the fact that slide device 3—4 of the first form of construction is here replaced by a simple joint 3. 85

The rods 15 pivoted on the front portion of the fixed framework and on the sides of the frame of the seat have for effect, not only to limit the forward displacement of the seat, but also to lift the latter so as to give it the inclination most favorable for comfort (fig. 4). 90

In order to improve the balancing of the various parts, it is convenient to use one or more springs, the action of which is added to that of the weight of the seat for supporting the back in lifted position. 95 For instance, a coil spring 17 will be attached, at the front, to the fixed framework at 18, and, at the rear, to the seat, at 19, the direction of this spring being approximately in alignment with the long arm 6—7 of the bent lever. It results therefrom that the tension of this spring is without effect when the back is in lowered position and the seat moved back (fig. 3), whilst it efficiently assists in lifting the back when the seat is pulled forward (fig. 4). 105

The piece of furniture illustrated in figs. 5 to 7, comprises a seat 1 and a back 8 mounted on a frame in the manner already described with reference to figs. 3 and 4. These two parts are connected on either side, by an angle member 14 pivoted on the same, respectively at 3 and at 7 at each of its ends, and pivotally mounted, at its bent portion, on a stud 6 carried by the longitudinal member 20 of the frame. 110

115 A connecting rod 10, pivoted about a stud 11 carried by a member 21 secured to the frame 13, connects the latter to the back.

120 Finally, a connecting rod 15 pivoted on the longitudinal member 20 supports the front of the seat.

125 This piece of furniture can thus be converted as explained above for assuming either the ordinary arm-chair position 130

illustrated in fig. 5, or the large easy arm-chair position shown in fig. 6.

Its frame rests on the ground through the medium of a base devised as follows:

5 Each longitudinal member 20 is provided with a mortice 20a (fig. 7) in which fits the upper part of a corresponding longitudinal member 22 of this base.

A spindle 23 passes through these two 10 longitudinal members, and supports the front of the frame. The rear of the latter is supported by two tension springs 24, 25, attached, on the one hand, to the longitudinal member 20, and, on the other 15 hand, respectively, at a point of the base and at the end of a lever 26 pivoted about a stud 27 secured to this base.

This lever 26 cooperates with an abutment 28 on which it presses when the 20 spring 24 has stretched to a definite extent, so that from this moment only, the spring 25 participates to the suspension of the frame.

The upward pivotal movement of the 25 latter is limited by abutments 29 secured to the base, and against which the upper part of the longitudinal members 20 abut.

The springs 24, 25 are devised for 30 ensuring the comfortable suspension of the frame, and allowing the latter, when the piece of furniture is in the position illustrated in fig. 6 and occupied by a person, to rock as a rocking-chair about the spindle 23 under the weight of this 35 person.

The particular arrangement of the said springs also ensures a comfortable suspension, whatever may be the weight of the occupant.

40 Finally, besides the advantages already mentioned, in motor cars or railway vehicles for instance, the resilient suspension provided by these springs perfectly completes the suspension means of the 45 vehicle and the cushions or springs of the seat, and ensures the complete absorption of vibrations and shocks.

In ordinary arm-chair position, the frame is rendered rigid with the base and 50 its oscillations are prevented by two rods 30, pivotally mounted on studs carried by the longitudinal members 20, and in which are provided notches 30a engaging with tenons 31 secured on the base.

55 These rods are put out of action, whereby the frame is free to oscillate, by causing the said rods to pivot in the direction of the arrow F₂ (fig. 5).

60 This movement of the rods is automatically effected, when the seat 1 moves forward, through links 32 connecting the end of each rod 30 to the pivot on the seat of the corresponding angle member 14.

65 Reversely, when the piece of furniture

is again caused to take the ordinary arm-chair position, these links 32 automatically cause the rods 30 to engage with the tenons 31.

The various parts above mentioned are 70 devised for avoiding any risk of untimely movement of the seat or of the back under the weight of the occupant; for that purpose, the connecting rods 15 and the branches of the angle members 14 which 75 are pivoted on the seat have, as well in the arm-chair position as in the rocking-chair position, such inclinations that this weight causes the seat to be held stationary.

Moreover the rear of the back is provided with a shoulder 8a which, in arm-chair position, rests on a cross member 33 80 of the frame and is held stationary.

Finally, the notches 30a of the rods 85 30 are slightly inclined upwardly and forwardly, so that in the arm-chair position, the weight of the person seated tends to engage these notches still further 90 on to the said tenons 31, this efficiently assists in ensuring the locking of the

According to the modification illustrated in fig. 8, the frame directly rests 95 on the ground through its lower longitudinal members, which are provided with a convex portion for allowing the arm-chair to rock as ordinary rocking-chairs.

In the arm-chair position, these oscillations are prevented by feet 34 pivotally 100 mounted, at the rear of the frame, on studs 35.

These feet are retracted in the rocking-chair position and are then placed in the 105 position illustrated in dot and dash lines at 34a.

The pivotal movement of the feet 34 is automatically controlled by the mechanism connecting the back and the seat, 110 through the medium of links 32 similar to those already described.

It is obvious that the shape and style of the arm-chair, the mechanisms connecting the back and the seat, those 115 allowing the frame to oscillate or preventing these oscillations, and eventually, the automatic control of these latter mechanisms, can be modified in any suitable manner, without departing thereby from 120 the scope of the invention.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim 125 is:—

1. An arm-chair, with a seat movable forward and backward and a back rockably mounted on the framework, connected 130 together by levers so that their relative

- position can be modified for converting the arm-chair into an easy arm-chair, characterised by the fact that the seat and back are connected together and to the framework of the arm-chair in such a manner that the back is raised bodily a determined amount when the seat is moved forward, whilst it is lowered bodily an equivalent amount behind the seat, when the latter is moved backward.
2. An arm-chair as claimed in claim 1, in which a straight or bent lever, connecting the seat and the back, is rockably mounted on the framework of the arm-chair, and is pivoted on the seat at a point which is located slightly behind the pivot on the framework when the seat is pushed backward in the arm-chair position, and which is moved in front of the said pivot when the seat is in the semi-couch position.
3. An arm-chair as claimed in claim 1, the seat of which is connected to the framework at its front part, by rocking links so that the front of the seat is compelled to rise at the same time as it is moved forward.
4. An arm-chair as claimed in claim 1, the framework of which is rockably mounted on a base and is connected to the latter by springs arranged for balancing the weight of the occupant, abutments being provided for preventing the rocking movement of the said framework relatively to the base as long as the seat and back are in the arm-chair position, and for allowing this rocking movement when these parts are in the semi-couch position.
5. An arm-chair as claimed in claim 1, the framework of which rests on the ground through rounded parts allowing rocking movement as a rocking-chair, and is provided with movable feet which are connected to the seat and to the back so as to rest on the ground for preventing the rocking movement when the seat and the back are moved to the arm-chair position, and which are retracted when these parts are in the semi-couch position.
6. A convertible arm-chair as claimed in claim 1, and substantially as described with reference to figs. 1 and 2.
7. A convertible arm-chair as claimed in claim 1, and substantially as described with reference to figs. 3 and 4.
8. A convertible arm-chair as claimed in claim 1, and substantially as described with reference to figs. 5 to 7.
9. A convertible arm-chair as claimed in claim 1, and substantially as described with reference to fig. 8.

Dated this 24th day of March, 1932.

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20 to 23, Holborn, London, E.C.1,
Agents for the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1

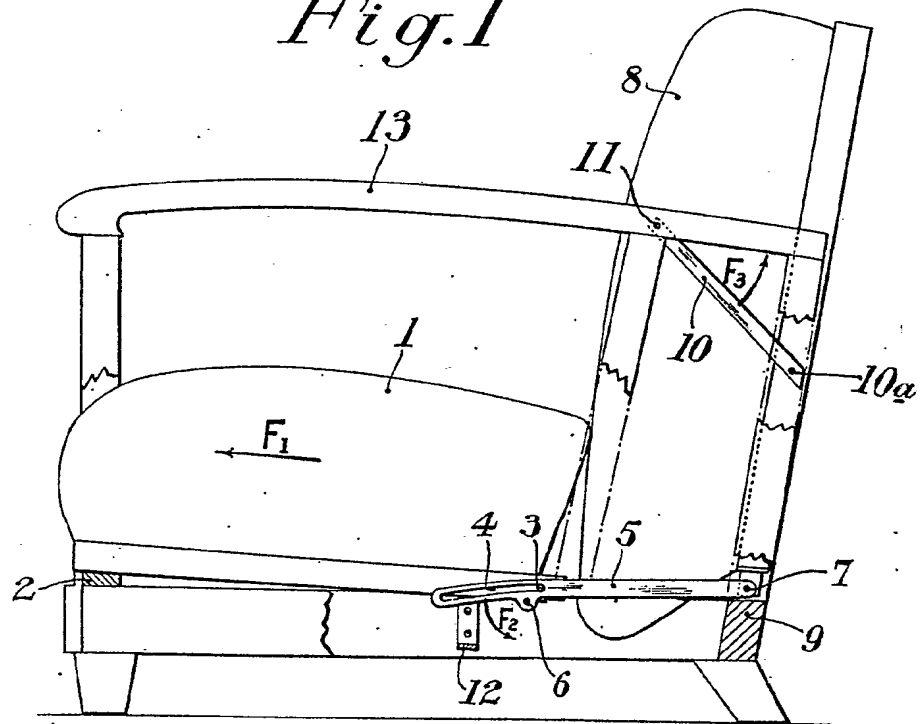


Fig. 2

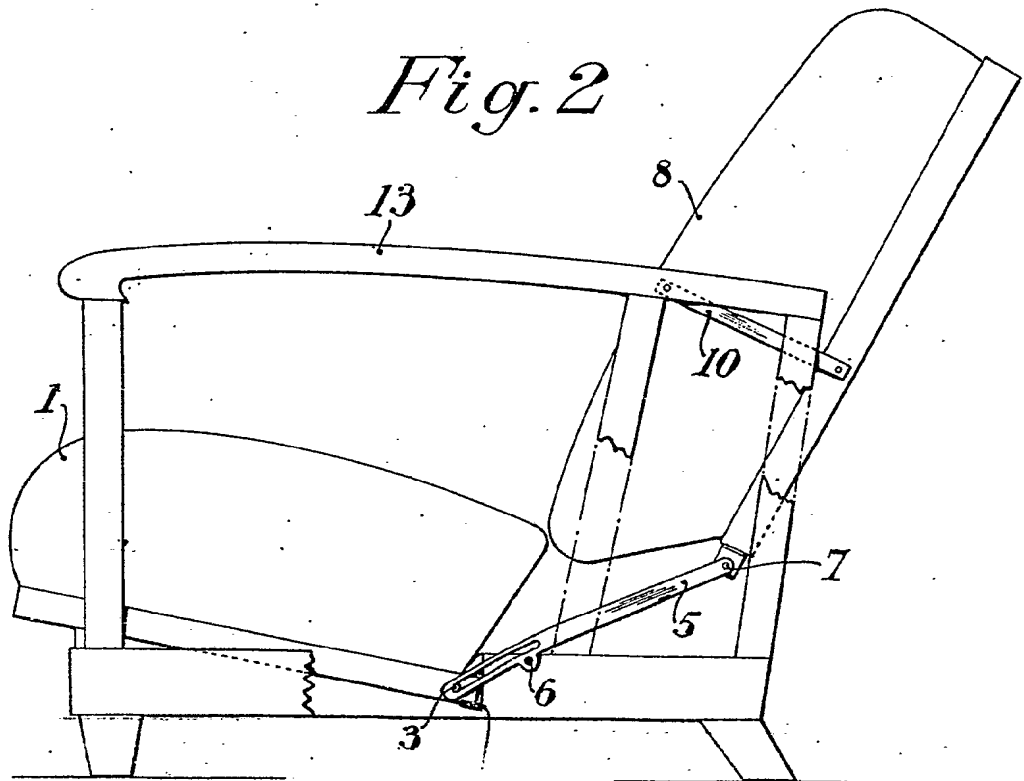


Fig. 3

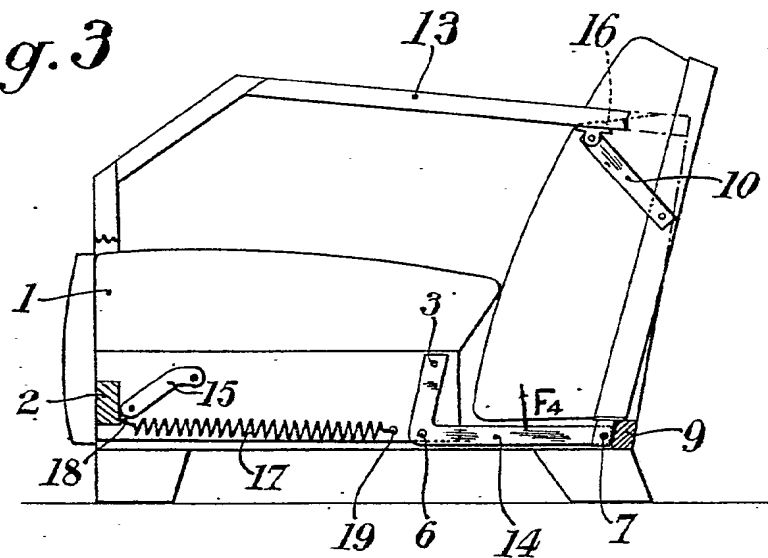
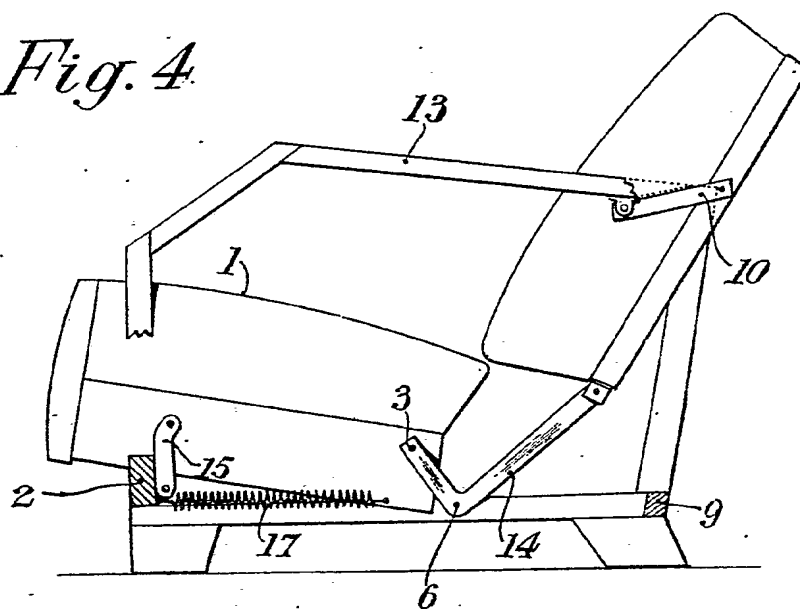


Fig. 4



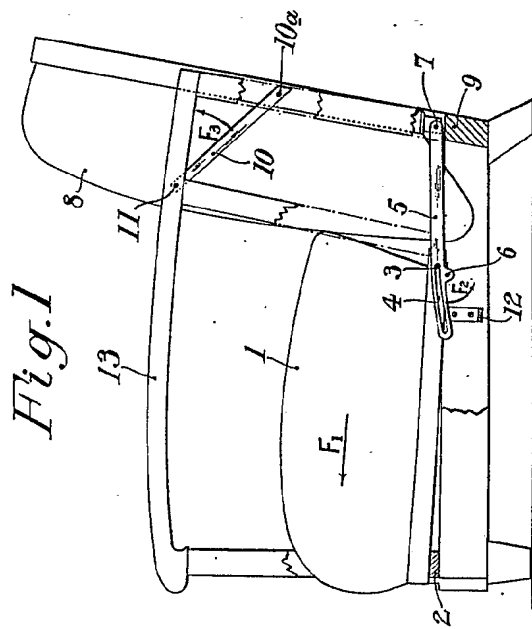


Fig. 1

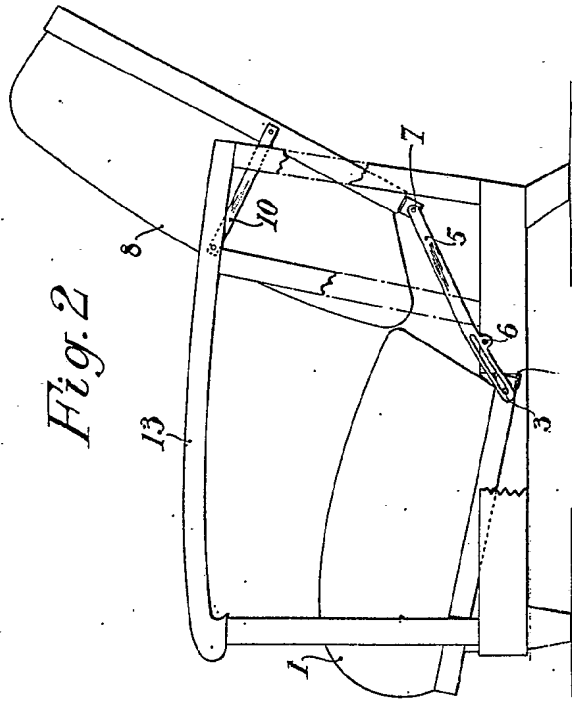


Fig. 2

Fig. 3

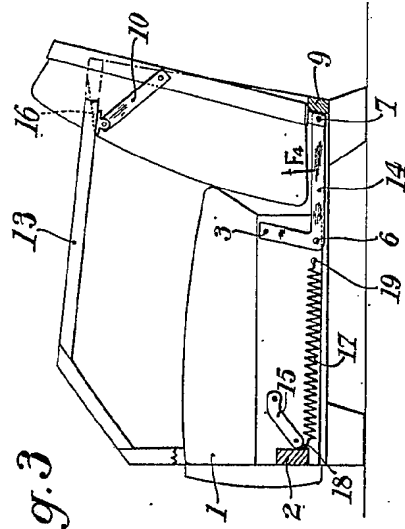
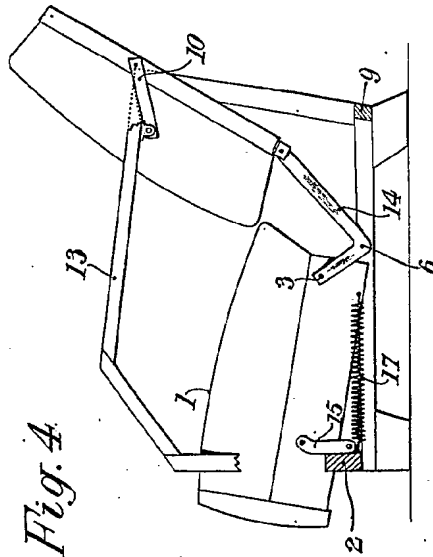


Fig. 4



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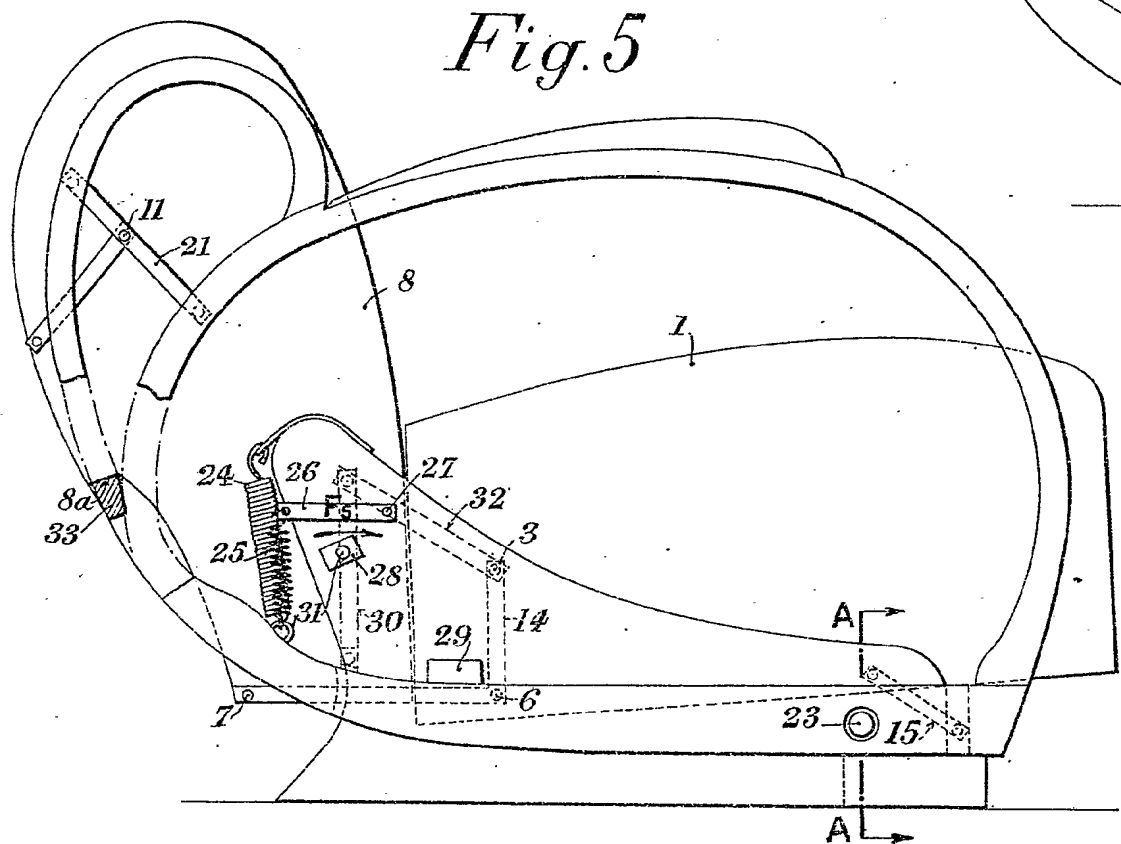
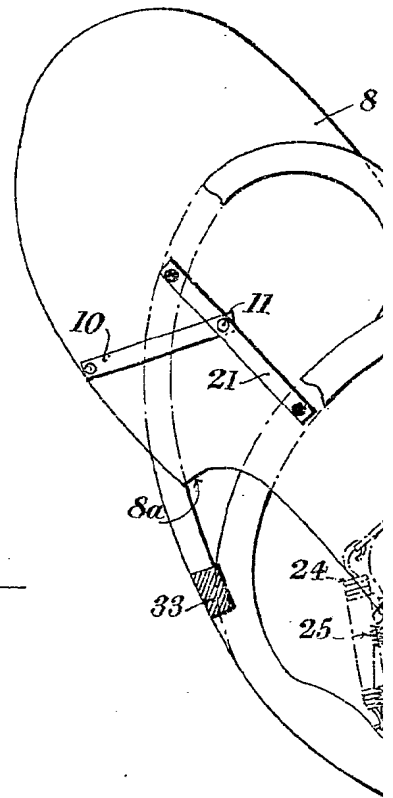
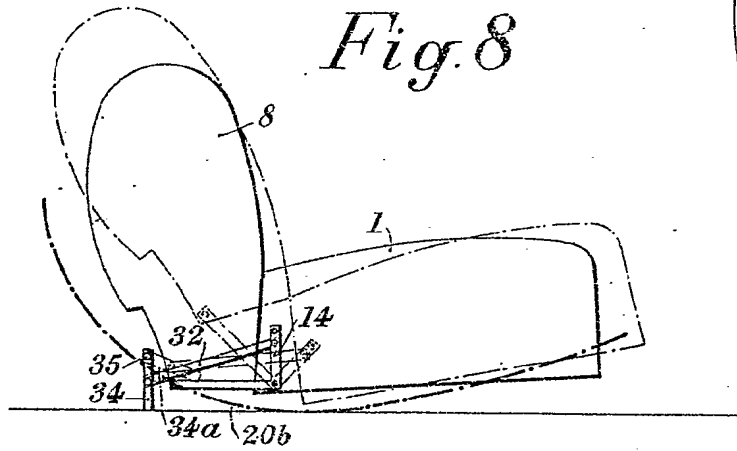


Fig. 6

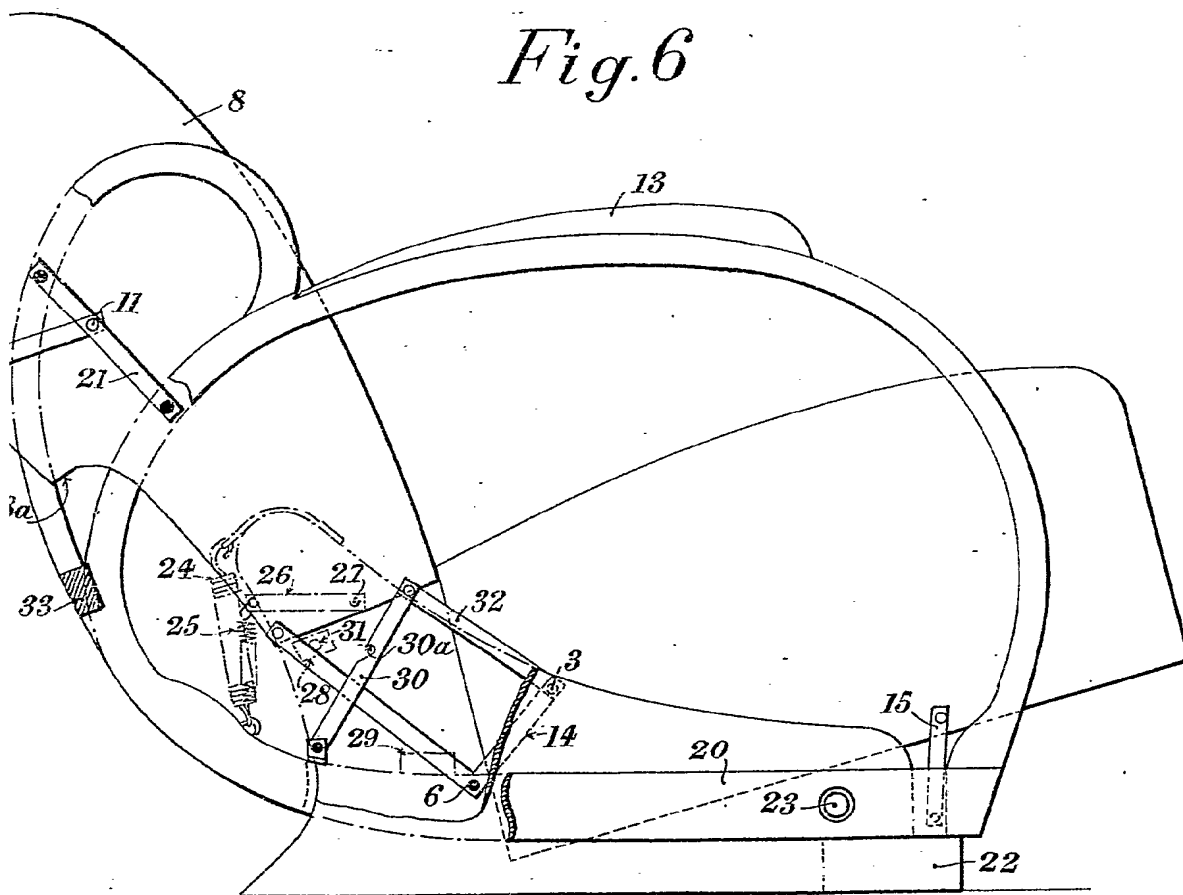


Fig. 7

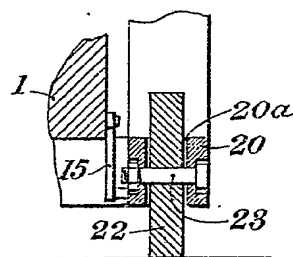


Fig. 8

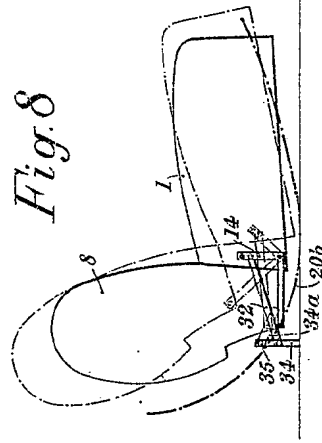


Fig. 6

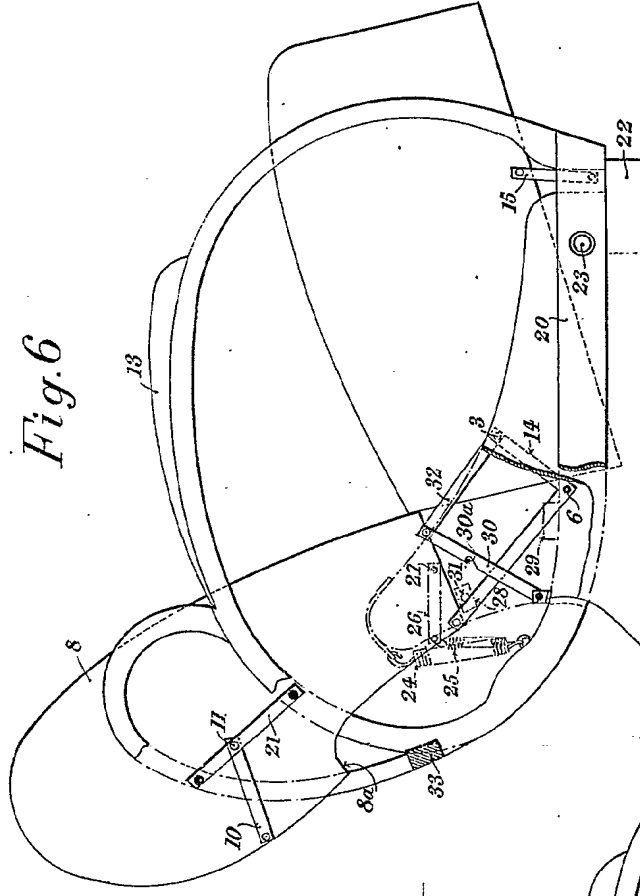


Fig. 5

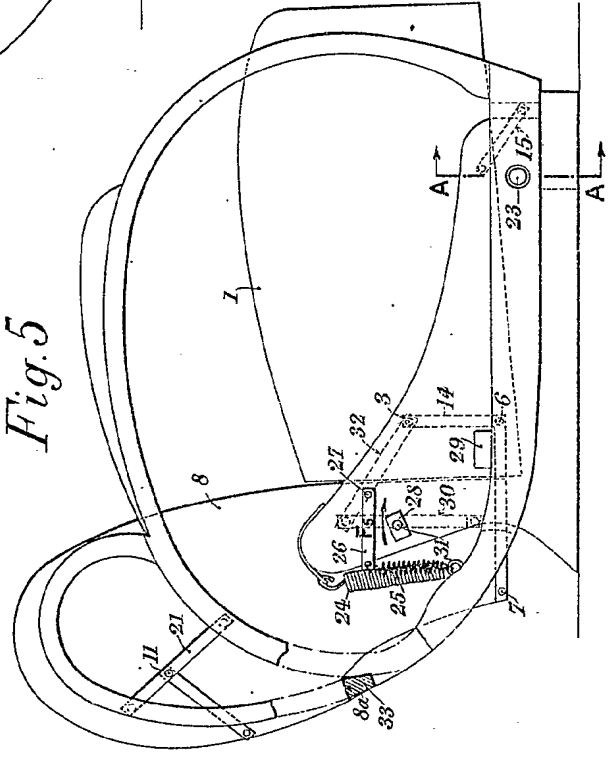
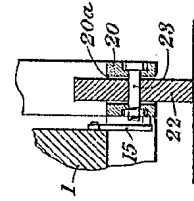


Fig. 7



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